

SIXPENCE

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A NEW TYPE OF AUDIO FREQUENCY GENERATOR

K. Ridgway (Laboratory Committee)

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For an audio frequency generator to be considered suitable for laboratory use it must measure up to certain requirements, namely:-

1. Ample Frequency Range (20-15,000 cycles)
2. Purity of waveform
3. Good frequency Stability
4. Constant amplitude.

Whilst for many years now the Beat Frequency Oscillator has held pride of place in the laboratory as an audio source, its disadvantages, particularly those associated with the simple and cheaper types, have been long recognised.

Recently a new type of oscillator has made its appearance, namely the Resistance Capacity Oscillator, sometimes known as the Phase Shift or Negative Feedback Oscillator.

Several variations of this type of oscillator have appeared in recent years and certain manufacturers in England and America have put them into production.

The oscillator is relatively simple in design and seems to meet all the basic requirements of an audio source without any of the disadvantages of the Beat Frequency Oscillator.

In practice the oscillator consists of a two stage resistance coupled amplifier, which is back coupled in such a manner that the positive feedback is applied to the grid of the first valve thus causing oscillation.

In the circuit to be described here (1) the two stages are back coupled through a Wien Bridge which supplies both positive and negative feedback. The Bridge is shown in Fig. 1.

Let us consider how this bridge operates. An audio frequency voltage is applied across points A and B. The conditions of balance of this bridge require that there be zero phase shift and zero voltage difference between points X and Y.

(1) Audio Frequency Generator, by S.K. Lewer B.Sc. Wireless World, January, 1944, page 2.

Obviously the phase at Y will be the same as that at A, whilst the voltage amplitude at Y depends on the ratio $R_3 R_4$.

The conditions in the arms AX and XB are not so easily explained.

Firstly let us consider the series arm AX. Here at the applied frequency f the current in this arm will lead the voltage by an angle.

$$\tan \phi = \frac{1}{\omega R_1 C_1}$$

Whilst in the parallel arm XB the current will lead the voltage by an angle

$$\tan \phi = \omega R_2 C_2$$

$$\text{where } \omega = 2\pi f$$

Consequently there will be zero phase shift when:-

$$\frac{1}{\omega R_1 C_1} = \omega R_2 C_2$$

$$\text{or when } \omega^2 = \frac{1}{R_1 R_2 C_1 C_2}$$

therefore the frequency at which there is zero phase shift is:-

$$f = \frac{1}{2\pi} \sqrt{\frac{1}{R_1 R_2 C_1 C_2}}$$

If we make $R_1 = R_2$ and $C_1 = C_2$ this becomes $f = \frac{1}{2\pi} \sqrt{\frac{1}{R_1 C_1}}$
This being the balance frequency.

The conditions of balance of the bridge may be expressed as follows -

$$\frac{Z_{AX}}{Z_{BX}} = \frac{R_3}{R_4}$$

Substituting the Impedance of the series circuit for Z_{AX} we have

$$\frac{\sqrt{R_1^2 + \frac{L}{C_1}}}{{}^2} + \left(\frac{1}{\omega C_1} \right)^2$$

Likewise substituting the impedance of the parallel circuit for Z_{BX} we have

$$\sqrt{\frac{1}{R_2^2} + \left(\frac{I}{\omega C_2} \right)^2}$$

Our equation then becomes

$$\frac{\sqrt{R_1^2 + \frac{1}{(\omega C_1)^2}}}{\frac{1}{R_2^2 + (\omega C_2)^2}} = \frac{R_3}{R_4}$$

Since we have decided to make $R_1 = R_2$ and $C_1 = C_2$ this becomes -

$$\sqrt{R_1^2 + \frac{1}{(\omega C_1)^2}} \times \sqrt{\frac{1}{R_1^2 + (\omega C_1)^2}} = \frac{R_3}{R_4}$$

$$= \sqrt{\frac{1}{(\omega C_1 R_1)^2} + (\omega R_1 C_1)^2} = \frac{R_3}{R_4}$$

Since we have already shown that at balance $f = \frac{1}{2\pi R_1 C_1}$
or $\omega R_1 C_1 = 1$

our equation becomes $\frac{Z_{AX}}{Z_{BX}} = \frac{2}{1}$

Therefore $\frac{Z_{AX}}{Z_{BX}} = \frac{R_3}{R_4}$ Therefore $R_3 = 2R_4$

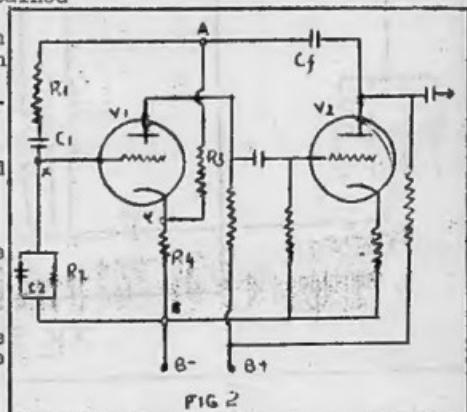
Therefore with these conditions met our bridge is balanced at a frequency determined by the circuit constants $R_1 C_1$.

Let us now apply the bridge to a circuit of a two stage resistance coupled amplifier, Fig 2. Note that $R_1 C_1$ and $R_2 C_2$ form the tuning circuit, and that R_4 is the cathode resistance of V_1 .

The feed back voltage is obtained from the plate of V_2 and is applied across A and B through the feedback condenser C_f . Both positive and negative feedbacks are obtained by connecting X to the grid and to the cathode of V_1 respectively.

When the bridge is balanced the phase and voltage amplitude at X and Y are equal, consequently oscillation cannot take place as the negative feedback equals the positive.

If, however, we make R_3 variable, we are able to unbalance the bridge until there is a slight excess of positive feedback and the circuit will generate oscillations.



These oscillations can only occur at the balance frequency, for at all other frequencies there is an excess of negative feedback.

The frequency of oscillation in the R-C oscillator is inversely proportional to the tuning capacity, unlike the BF Oscillator, where the frequency determining circuit comprises inductance and capacity and the frequency is inversely proportional to the square root of the capacity.

This feature makes for convenience of tuning calibration, especially at the lower frequencies where the scale is very open -- So much, for the theory, now for a practical case.

The Laboratory Committee of the Victorian Division has built up an experimental model R-C Oscillator to the circuit in Fig 3.

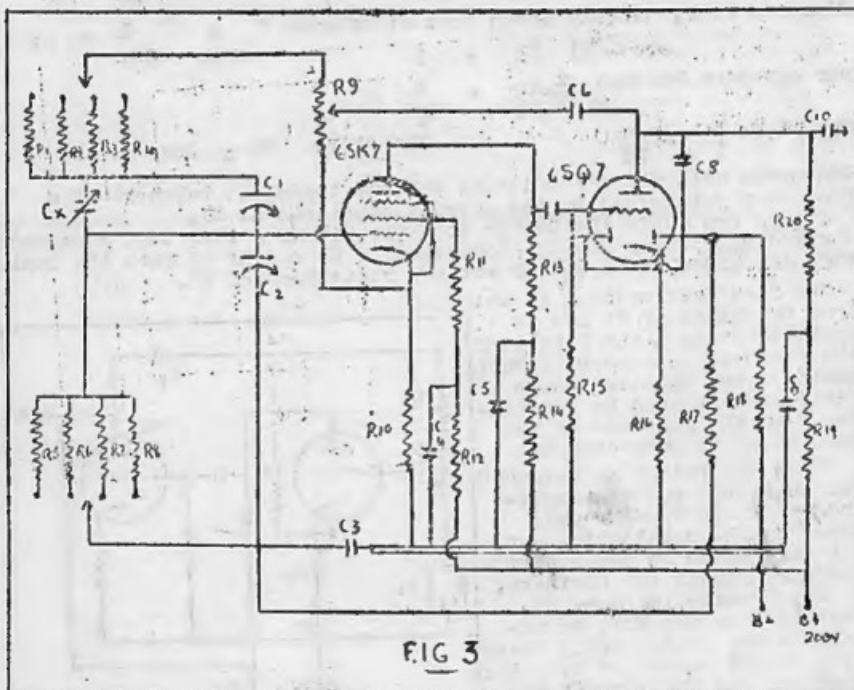


FIG. 3

Transformer Problems

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C1 - C2 .. 2 gang 0.00043 Mfd
CX .. 100 mfd midget
C2,6 .. 0.5 400 volt
C6,9 .. 0.25 300 volt
C4,7,8,10 .. 0.1 400 volt

R1,5 .. 3.5 meg 1 watt (matched)
R2,8 .. 1 meg " "
R3,7 .. 375,000 ohms "
R4,9 .. 120,000 " "
R9 .. 10,000 ohm Potentiometer

R10 .. 2000 ohms
R11 .. 50,000 "
R12 .. 50,000 "
R13 .. 50,000 "
R14 .. 50,000 "
R15 .. 0.5 meg
R16 .. 1000 "
R17 .. 1 meg
R18 .. 1 meg
R19 .. 50,000 "
R20 .. 20,000 "

The results achieved were entirely satisfactory and served to prove that the basic design is entirely sound and eminently suitable for use as a laboratory instrument.

The circuit used is interesting. One important feature is the use of automatic amplitude control which is responsible for holding the output amplitude within very close limits.

The tuning is broken up into four ranges, and using a standard two gang BCL condenser in conjunction with the value of tuning resistance given in the text the range are approximately (a) 30-200 cycles/second. (b) 150-1000 c/s (c) 500-2500 c/s (d) 2000-15,000 c/s

Tests were carried out on a Cathode Ray Oscilloscope and the waveform was found to be perfectly sinusoidal over the entire

frequency range. The output amplitude was within $\pm 2\text{db}$ of flat over this range.

It was found to be desirable to provide shielding for the elements comprising the oscillatory circuit. This shielding should preferably take the form of a box which should enclose everything associated with V1 and V2.

As the frame of the variable condenser is at grid potential this shielding will cause a comparatively large capacity to appear between the grid of V1 and earth. To balance out this capacity the condenser Cx is connected across the upper section of the tuning condenser (cl).

The setting of the feedback potentiometer R9 is extremely critical, too much positive feedback will introduce appreciable distortion, while insufficient positive feedback will result in the cessation of oscillation.

Providing that the pairs of tuning resistances are accurately matched and Cx is adjusted to balance out stray capacities, the position of R9, once set, should not require further adjustment.

The automatic amplitude control functions in a similar manner to the AVC in a conventional broadcast receiver. A portion of the output of V2 is rectified by the diodes and used to control the conductance of V1, a variable mu pentode.

Stability is an important consideration in audio frequency oscillators.

The degree of stability of the R-C Oscillator is dependent upon the characteristics of the tuning resistances. Most carbon resistances exhibit varying characteristics due to ageing and loading, and it goes without saying that the best procurable should be used here.

If resistances possessing moisture and humidity resisting characteristics are used the stability will be excellent. Needless to say they should be non-inductive.

The stability appears to be substantially independant of voltage fluctuations.

Quoting Mr. S. K Lower in Wireless World a line voltage variation of between 160 and 260 volts was found to produce less than 0.1 per cent variation in frequency. Stability of this order is reached within 30 seconds of switching on from a cold start.

The oscillator is quite critical as to the load applied to V2. The output is insufficient for laboratory purposes and an output amplifier is necessary. The output amplifier and the oscillator should be separated by a buffer stage, and any volume control used in the circuit should be placed in such a position that its

setting, will not have any affect upon the oscillator proper.

The amplifier should be designed to have a flat frequency response over the frequency range of the oscillator, and particular attention should be paid to the values of the coupling condensers used.

The power supply to the oscillator should be decoupled to avoid any interaction between oscillator and amplifier.

The Laboratory Committee is convinced of the possibilities of the R-C Oscillator, and intends to design and build a complete unit shortly for use in the Laboratory. This model will probably use push-pull triodes in the output using the cathode follower method of output coupling.

CRYSTAL OSCILLATORS

Within limits, the frequency of a piezo-electric crystal can be varied by regulating the thickness of the air gap between the free face of the crystal and its adjacent electrode. A smooth and accurate adjustment is, however, essential to avoid sudden jumps in frequency, and to ensure stability of oscillation after each setting.

According to a recent patent, the crystal and its base electrode are mounted on the inclined surface of a stationary wedge-shaped holder, whilst the opposite electrode is set on the inclined surface of a second similarly shaped holder. Both holders are arranged in an outer casing so that the second holder can be moved transversely, in a straight line, relatively to the first, say by a screw under spring control. Both the inclined surfaces are thus kept parallel to each other in the course of their movement, whilst the distance between them is being altered by the control screw to regulate the air-gap. To avoid resonance due to the gap, the crystal should be Y-cut; or the unit may be mounted inside an evacuated bulb.

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SUPERSONICS USED IN TEST FOR RUBBER TYRES.

A new device which tests rubber tyres for flaws by means of supersonic waves has recently been demonstrated. The tyre is placed in a trough of water and slowly rolled. The supersonic waves are transmitted through the water to the tyre sides and a microphone picks up the waves passing through the rubber. As long as the rubber is solid the waves come through, but a flaw in the rubber will immediately break the continuity of the waves.

THE TECHNICAL LIBRARY

ELECTRICAL ESSENTIALS OF RADIO... Morris Slurzberg and Wm. Osterheld
New York 1944..529 pages...32/-

This book has the elements of a good manual of preliminary training of radio operators, but unfortunately is marred by a few errors which will no doubt be rectified in future editions.

The subject is covered under the following headings:- 1 Communication. 2. Basic theory of Electricity. 3. Batteries. 4. Electric circuits. 5. Magnetism. 6. Meters. 7. Electrical Power Apparatus. 8. Inductances. 9. Capacitance. 10. AC Circuits. 11. Resonance. 12. Basic Radio Circuits ... APPENDIX ... Drawing Symbols and Pictures of Electrical and Radio Parts...Symbols and Abbreviations... Formulas commonly used...Table of Spec Resistance and Température co-efficient of various metals at 20 degrees Centigrade...Bare Copper Wire Tables 25 degrees Centigrade and 77 degrees F. Dielectric Constant and Dielectric Strength of various materials. Standard Color Code of Resistors...Standard Color Code of Mica Condensers...Standard Color Code of Transformer Leads...Trigonometry...Sine and Cosine Tables.

Illustrations both line and half-tone are numerous and well done except perhaps the block on page 5 which depicts a Lucas Lamp and is captioned "Heliograph in use."

On page 434 the authors assert that the primary of an IFT is parallel tuned and the secondary is series tuned. I am afraid I cannot see it.

A rather interesting statement is made on page 471 to the effect that most BCL receivers reproduce only up to 5000 cycles and that the majority of stations cut off at about 6000 cycles because of this, although equipped to cover the entire audible range. It appears that the set manufacturers crack the whip and the stations humbly follow.

Fortunately the position is different in Australia, where although the set makers, for reasons known only to themselves, or perhaps no reason at all, produce receivers cutting off at 5000 cycles as an absolute maximum, the majority of stations go for wide frequency range for the benefit of those all too few BCL's who feel ill at the sound of a speaker booming its heart out in a box.

All this lends weight to Messrs. S. and O's assertion that the main advantage of F.M. is its noise reducing capability, in fact under Australian conditions the introduction of F.M. would result in no increase in transmitted quality (the receiver audio channels would be much better but what's to stop that now?), a fact which the manufacturers undoubtedly realise but which they seem reluctant to divulge to the public.

All books reviewed on this page are by courtesy of McGills Newsagency, Elizabeth Street, Melbourne.

SLOUCH HATS and FORAGE CAPS

With the Australians again permitted to be officially in action on the fighting Pacific Islands, the Hams are bound to "among those present and our spirit should once again get among the "fighting" news so to speak...so, you who read this, get out the pencil & paper.

Morris Wixson VK4WN once head of the prewar R.A.F.W.R. in N.S.W. in those now far off days, and at present a Flying Commander seems to keep up pretty well with MacArthur and was last heard of in the Philippines. I'm not sure what Morris does as regards R.A.F. Sigs, but he never seems to miss a jaunt out with the US PT Boats when they go on a patrol. He apparently just dotes on variety. Hi!

The Hon. Secy. of the New Guinea Radio Club arrived at ZYC's the other day, so I guess they are short of a Sec., at least pro-tem. But Wartime Radio Clubs are sure to suffer from this complaint so... you want to install several Assistant Secs in the beginning. As Syd says...no sooner did they decide to make a start with the Club than a regular census started. In the usual Navy fashion Syd came home the easiest way. Oh yes, plane from Lea to Madang, Madang to Brisbane, and poor chap had to come "all the rest of the way" by a train. shame! Next month I hope to be able to give you news of what happened at the Club in the absence of P/O Sec. Sydney Clarke.

Reading the news you will know that the H.M.A.S. Australia has returned after a rather exciting time around the Philippines. Both our Ham representatives C/F.C. SOF, and Ldg/Tel SIG came through OK. At the moment the latter is on leave in his home State while SOF has to wait for the second batch of liberty. While Frank is at home will some VRs show him how to anchor his hen house...short of taking home the Australia's anchor, complete with chain...there must be a simpler method I've been telling him. Hi! The news of the trip will have to await, along with all the other good news till the "lid is lifted," so I have nothing to add at the moment. Frank's one regret was that at that American Base where they went for repairs, there wasn't any ham gear available. Hi!

Major John Foldi VK4KT is on leave here at the moment. He expects to be returning to New Guinea very soon to take up work on a Government Station.

Another VK4 duo down in V13 is P/O Les Page VK4LP. Les was a W/O when we last saw him here, and in the meantime like many of the RAAF he has been "getting round a bit." At the moment he is contemplating installing a UHF outfit on his jeep, but, as he puts it, while the installation is proceeding he has to think up a sufficient reason as to WHY it is there.

S/L Frank Goyen 2UX writes from up Darwin way...just down the road from 3RJ...wonder just how far down what road????(ZYC)...Frank writes "from a dangerously exposed position (attacked by squadrons of March Flies under an umbrella of Wasps), in the front line

thirty miles behind the AWAS." So, you, who know him will see he is little changed. His main complaint, Ray, is about the "dryness." Hi! Fly/Lt Frank D'ne of 20L has just had a few days at Home from over at Fort Mifflin where he has to go with the Sigs, side of the lads who navigate (more or less) the rivers one sees overhead in most areas. He saw Gordon Kortright, a D/C these days has just turned up at that station, what's the news 20L, ??? haven't heard of you for years, oh, (ZYG). Another lost ham, so to speak, was whom he mentioned as having recently been at Mt. Gambier was MacNaughton of 2ZH...haven't heard of you either since the War, Mac (ZIG). Frank mentions that S/L Jack Moyle is now in VIM.

Fly/Lt Athol Wells 2FI is reported in Hospital again with a bout of Malaria...tough luck, Athol, hope when you read this you are AI again.

2FZ, Gordon Reid of Tomora is another Ham nothing has been heard of. Gordon, it appears joined the RCAF as an Electrical Mechanic, transferred to a "hush hush" dept...went to New Guinea...got a bad dose of Malaria, and at the moment is Fridg. Mechanic for Eastern Area. Just a few lines for five years' work. Hi!

Major Don B. Knock 2NO, by the time you read this, will be back in "civvies." As Don says, this is his third war, so he is about up to retiring. Hi! Don got mixed up in the first World War just about as soon as he left school (1914-15) then put 1919 in over in Russia when the Revolution first started, and then he kicked off for his third in 1939, and after six years of it...has decided to take an interest in N.S.W. Div. affairs for a change. SEQ, Ivan Miller was Don's Service dentist...so you can bet the work was an fb job. Another Ham 2JC is a RCAF Dentist around the place, but we have no news of where he is.

Sgt Alan Jocelyn is due up on leave from Benalla. Alan has discovered that 2AIZ Gordon Nolan is an engineer at 2X, so he and Jim Fudge who has passed his AOPC but his not allotted yet, spend all their spare time with Gordon. Got everything tied down on, you know there's 2AIS? Hi! (ZIG).

It is with deep regret that I have to announce the death of Major J.D. Morris, "KCB". He was a Prisoner of War in Java, for two years and four months and los, his life taken a transport sunk near Sumatra on Sept 20th, 1944. He joined the R.A.F. in June 1940 and had previously served one year in the Permanent Forces and 3 years in the Militia. He also saw service in the Middle East for two years.

And so, will kept Muth, I'll be hearing from you...there is no let off...I'll column NEEDS NOTES...twelve times a year, so remember Jim Corbin, 78 Maloney Street, Eastlakes (Mascot) or Phone MU1092.

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D I V I S I O N A L N O T E S

- Federal Headquarters -

At its 35th Annual General Meeting the New South Wales Division had the pleasure of entertaining quite a few visitors, among whom were several from VK3 including 3XZ who had some criticism to offer in an endeavor to ascertain the views of as many Australian Amateurs as possible, regarding Post War Amateur Radio.

3XZ was disappointed with the winning entries and felt that they followed the sub-headings that were given as suggestions when the contest was first written up in the magazine, too closely. He also stated that quite a number of VK3 members were very hazy as to what was required by F.H.Q. and that the matter had been discussed at a Divisional meeting and that was the general opinion of all present.

Like 3XZ, Federal Headquarters were also disappointed with the result of the Essay Competition. The members of the present Federal Executive have all been associated with the New South Wales Divisional Council for a number of years. During the past eight years it has been the policy of that Council to keep Institute members as fully informed as possible regarding all matters relating to Amateur Radio. In addition it has fostered the practice of members asking for information. When elected to the Federal Executive the same policy was put into practice and what subject has greater importance than the Post War era.

Federal Headquarters were disappointed from the point of view of the paucity of entries, despite the fact that the competition had been advertised for four months in the magazine. Entries were poor both in quantity and quality, all States being equally at fault. Frankly, it was hard to believe that so little interest was shown.

Federal Headquarters does not feel that is is above constructive criticism - welcomes it in fact, but does resent very strongly criticism undeserved.

If, as 3XZ states, the matter was discussed at Victorian Divisional meetings and members expressed themselves as being somewhat in the dark as to what was required by F.H.Q. it was the duty of the Divisional Secretary to take the matter up and obtain the necessary information - information that would be willingly given.

It is very difficult to follow 3XZ's statement that the winning entries A.M.L followed the SUGGESTED sub headings, but quite a few others did. Actually the only really new suggestion made worthy of consideration was that Licensees' should be graded into A, B and C, similar to the States.

It is extremely regretted that these paragraphs have had to be written, but as SXYZ has stated, quite a deal of criticism had been made at a General meeting, there is no option but to reply. SXYZ is to be complimented even at this late stage upon doing a job that someone else in a more responsible position failed to do!

(I have referred these notes to the Victorian Division, who wish to state that the facts as stated above are not entirely correct. The subject of the Esso Competition had been given considerable publicity both in Divisional notes and at Divisional meetings, and at no time did any individual member request further information. In view of those facts no Officer of the Victorian Division failed in his duty.....THE EDITOR)

NEW SOUTH WALES DIVISION

The February General Meeting of the Division could be quite easily described as Navy night due to the large number of members who are attached to the Silent Service who were present.

The Chairman, in declaring the Meeting open, extended a welcome to Chief Petty Officer Telegraphists Frank O'Dwyer VK3QR and Gordon McLead VK2ADC P/O Tel. Sid Clark and L.W.O. Reg Morgan. The Army was represented by Captain Fred Carruthers looking very fit and well. An international visitor Frank Little second op (?) at W7GDE was also present.

With reference to the Annual Election of Council only nine nominations were received viz., Messrs. Dickson, Fryar, Cole, Hignett, Peterson, Priddin, Lumsden, Ryan and Treharne. The nominations of Messrs. Cole and Hignett were subsequently withdrawn and thus it was not necessary to hold an election. Mr. Ern Hodgkins who had occupied the position of Vice-President in previous Councils, having been transferred to Kempsell, was not available for nomination. Ern's transfer was a definite loss to the Institute as he was a very keen and enthusiastic member.

At its first meeting after the Annual General Meeting the following Office Bearers were elected:-

Chairman ..	W. G. Ryan VK2TI
Vice-Chairman ..	H. F. Peterson VK2HP and E. Treharne VK2AFQ
Secretary ..	C. S. Hignett VK2LO
Treasurer ..	G. Cole VK2DI

All the above Officers were elected unopposed.

Several recommendations from Council were discussed, the first being that Lieutenant Jack Striker W6 MOV be elected to Honorary Membership in appreciation of the keen and practical interest that he had taken in the Bushfires Radio Network. The second recommendation was that 5% per annum of total membership subscriptions be set aside each year and invested in Government Securities in an endeavor to create a Reserve Fund. Both recommendations were unanimously endorsed.

Congratulations to our new "old" Councillor Morrie Lusby VK2WN upon joining the band of "Happy (?) Benedict's". Bring her up the right way old man. It's a great help when you have someone to write up the log and make out the Qsl's! Also in line for congratulations is Gordon Goto VK2DI who recently became a father again. Too bad it wasn't a daughter eh, but as you say, there are advantages in having two sons. Speaking of sons, you and ZYC should get together sometime and have a long yarn.

At the conclusion of General Business each of the visitors gave a short talk on his wanderings during the past five years, particularly JCB and his description of the Philippines and surrounding waters. Boy, if we could only get that chap to REALLY talk. 2ADC took us for a Furry trip from Alexandria to Tobruk. The boys were very interested in Salome and the "moral uplift" one meets in the Middle East!

Don't forget, March Meeting will be held Thursday 15th and all Amateurs are invited to be present.

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NEW SOUTH WALES BUSHFIRES NETWORK

For the second occasion during the past four years Amateur Radio History has been made in New South Wales. Recently the Institute was successful in obtaining some crystal blanks and by the combined efforts of VK2RA and W6 Mov these were ground to the required frequency. Those crystals were dead on frequency and the Amateurs concerned are to be congratulated.

On the night of Friday 9th February VL2EE, located at Young, was heard testing and calling one of his portables, thus obtaining the honor of being the first of the Network Stations to be heard in Sydney. It was right and fitting that this should be the case, as it was Jim Taylor, VK2TC, who first suggested the idea of making use of Experimenters and their Equipment as an aid to the Volunteer Fire Brigades, over twelve months ago.

In an endeavor to interest the right people the Institute had a particularly hard row to hoe and once interested the Department concerned did not feel inclined to spend any money on the scheme endeavoring to throw the onus on the Shire Councils and the Amateurs. The Institute felt that it would be failing in its duty if it were to allow the Experimenters to shoulder the whole of the cost and with the advent of the Bushfires in the Blue Mountains (!) it was found possible to have a much more lenient attitude adopted.

Associated with Jim Taylor at VL2EE are John Dwyer ZWA and Alan Thackeray VK2TA. These chaps are located well outside the town and have had to surmount quite a few difficulties before the installation was actually put on the air.

VL2EE was again heard on succeeding nights, but signal strength was not quite so strong, but nevertheless the frequency was checked ok by the R.I.

On Tuesday 13th February VL2EA was heard testing from Dubbo. The signal was an excellent one and despite a high noise level it was 100% readable right through the Test. Dubbo Section Leader is Max Moore VK2II and other Experimenters associated with him are 2ACT and 2AMR. Max at the present time is concentrating on aerials in an endeavor to obtain a good strong ground wave and hopes to obtain a meteorological balloon to raise the vertical area. Several photos are to hand showing Max and Bill operating the truck and pack sets respectively and its unfortunate that they can't be printed in the magazine. Watch the daily papers.

As previously mentioned the frequency in use is 3115 kcs and members are asked to tune round this frequency occasionally, and reports may be sent to H. J. Taylor "Bonnie Doone" Monteagle or M. Moore, McDonald Street, Dubbo.

It is hoped that three pack sets will be operating in each district very soon, but batteries are a big problem at the present time.

During the winter months it is proposed to push ahead with the organisation in other country towns in order that the summer of 1945 will see the Net operating on a more extensive basis.

Both ZTC and 2II have asked me to thank all those Amateurs who were good enough to make gear available so that they could get on the air quickly.

EMERGENCY COMMUNICATION NETWORK

After a lapse of two months brought about by Departmental re-organisation, the first Network Exercise for 1945 took place on 2nd February. All stations checked in on time and transmissions were well up to standard. Traffic was handled very smoothly and cleanly and reflected the assiduous manner in which the operators concerned applied themselves to their task during 1944.

It had been anticipated that three ships of the Sydney Harbor Patrol would have also participated in this exercise but unfortunately one craft had to withdraw whilst another was twenty minutes late in starting. This marred the exercise somewhat and meant that there was a late finish.

With reference to Network Stations hearing transmissions from the boats, it is pointed out that those craft work on a very much higher frequency, and whilst in contact with them the carrier from Control is kept running.

Exercises will continue to be held on the first Friday of each month until further notice.

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VICTORIAN DIVISION

February

The March Meeting saw rather a large muster of members and visitors. Those present were VK's SVX; 3NY; 3EN; 3KN; 3QS; 3XC 3IK; 3SZ; 3XZ; 3BJ; 3SQ; 3EW; 3XJ; 3YL; 2QZ; 3UC; 9RM; 3JO; SWY 3HK Messrs. Ridgway, Hibbet, Oakos and King.

Sgt. Peter Momfries VK9RM during the course of the evening gave a short talk on his Ham activities in New Guinea, mostly on his observations of tropic proofing, which proved of much interest to the gathering.

F/Lt Graham Colley VK3QZ who had recently returned from parts north where he on several occasions was one of the first wave of assault troops, also gave a short chat on some of his experiences and observations.

The highlight of the evening was a "free" movie show. This had been given considerable publicity in previous issues of the Magazine. Harry Kinneir 3KI brought along his 16 mm

projector complete with sound equipment, together with a collection of topical films. So great was the interest shown that after an hour's show (and the hour was growing late) those present were asked if they wished to see the remaining film which would run for half an hour.... there was an unanimous decision. Council wishes to express to Harry their thanks for the trouble he took to put on the show.

But that isn't all....There will be another show at the April 3rd. By courtesy of the R.A.A.F. Visual Training Centre, we have been able to obtain two Technical Films. The first, Cathode Ray Oscilloscope, which will run for twenty-five minutes, and the second, Thermionic Valves, which will run for forty minutes. Those attending that meeting will be assured of a number of technical films, together with a few topical features. So do not forget the April Meeting.

As mentioned last month, the Laboratory Committee have been and are proving to be a very live body. This month they report that although many copies of periodicals have been returned since the original check of magazines in the library, the files are still far from complete, and no further offers have been received in response to the appeal in the January issue.

Copies of Magazines still required are:-

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